

WHAT IS CLAIMED IS:

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1. An image sensing device comprising:  
light source means;  
a recording member on which an image is formed and  
5 conveyed in one direction;  
illumination means for causing a light beam  
emitted from said light source means to obliquely  
illuminate said recording member; and  
imaging means for condensing specularly reflected  
10 light from the image on said recording member and  
causing the reflected light to travel to a surface of  
light receiving means, said image sensing device  
obtaining positional information of the image on said  
recording member on the basis of a signal obtained by  
15 said light receiving means,  
wherein when the amount of displacement of the  
recording member in a vertical direction during  
conveyance of said recording member is  $d$ , an angle  
between the optical axis of said imaging means and a  
20 normal to said recording member is  $\theta$  (degrees), and  
resolution of the image formed on said recording member  
is  $R$  (dpi), the components are set so that  
 $d \cdot \tan \theta < (25.4/R) \times 1000$  is satisfied.  
2. A device according to claim 1, wherein the  
25 angle  $\theta$  (degrees) satisfies  
 $5^\circ < \theta < 35^\circ$ .

3. A device according to claim 1, wherein said light source means comprises an LED light source, and said illumination means includes an illumination lens for condensing a light beam from said LED light source and causing the light beam to travel to said recording member.

4. A device according to claim 1, wherein said imaging means includes an imaging lens for forming, on a surface of said light receiving means, an image on said recording member.

5. A device according to claim 1, further comprising an imaging lens for forming, the image on the recording member onto said light receiving means, wherein when imaging magnification of said imaging lens is assumed to be  $\beta$ ,

$0.75 < |\beta| < 1.25$  is satisfied.

20            6. A device according to claim 1, wherein the  
angle  $\theta$  (degrees) satisfies

$$25^{\circ} < \theta < 35^{\circ}.$$

25 7. An image forming apparatus including an image sensing device according to any one of claims 1 to 6, wherein said image forming apparatus forms a color image by using said image sensing device.

8. An image sensing device comprising:

light source means;

illumination means including an irradiation lens  
for irradiating, with a light beam from said light

5 source means, a recording member on which an image is  
formed; and

imaging means including an imaging lens for  
forming, onto a surface of a light receiving means, the  
image on said recording member, said image sensing  
10 device detecting the image on the recording member on  
the basis of a signal obtained by said light receiving  
means,

wherein when said recording member has a specular  
reflection surface, a stop is provided at or close to a  
15 position to be conjugate with the light emitting point  
of said light source means.

9. A device according to claim 8, wherein when  
the imaging magnification at which the light emitting  
20 point of said light source is imaged at the conjugate  
position is assumed to be  $\beta$ ,

$1 < |\beta| < 7$  is satisfied.

10. A device according to claim 8, wherein the  
25 aperture of the stop has a size substantially equal to  
or smaller than the size of the image of the light  
emitting point of said light source means.

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11. A device according claim 8, wherein the stop is disposed between said imaging means and said light receiving means.

12. A device according to claim 8, wherein said light receiving means detects the image formed on said recording member to obtain positional information of the image.

13. A device according to claim 8, wherein said light receiving means detects density of the image formed on said recording member.

14. An image forming apparatus including an image sensing device according to any one of claims 8 to 13, wherein said image forming apparatus forms a color image by using said image sensing device.

15. An image sensing device comprising:  
light source means;  
illumination means including an irradiation lens for irradiating, with a light beam from said light source means, a recording medium on which an image is formed; and

imaging means including an imaging lens for forming, onto a surface of a light receiving means, the image on the recording medium, said image sensing

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device detecting the image on said recording member on the basis of a signal obtained by said light receiving means,

wherein said irradiation lens and said imaging lens are formed integrally with each other and made of a same material.

16. A device according to claim 15, wherein at least one of said irradiation lens and said imaging lens has at least one rotationally symmetrical aspherical surface.

17. A device according to claim 15, wherein at least one of said irradiation lens and said imaging lens has at least one anamorphic surface.

18. A device according to claim 15, wherein at least one surface of said irradiation lens and said imaging lens is inclined relative to a surface normal to said recording member.

19. A device according to claim 15, wherein at least one of the surface of said irradiation lens and said imaging lens on said recording member side is flat.

20. A device according to claim 15, wherein an

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optical axis of said irradiation lens and an optical axis of said imaging lens have equal angles formed in opposite directions from a surface normal to said recording member.

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21. A device according to claim 15, wherein said light source means is provided with a moving mechanism capable of displacing to an arbitrary position.

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22. A device according to claim 15, wherein said light receiving means is provided with a moving mechanism capable of displacing to an arbitrary position.

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23. A device according to claim 15, wherein said imaging means has a stop, and a light emitting surface of said light receiving means and the stop are made substantially conjugate with each other when a surface of said recording member is a specular reflection

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surface.

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24. A device according to claim 15, wherein said light receiving means detects the image formed on said recording member to obtain positional information of the image.

25. A device according to claim 15, wherein said

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light receiving means detects density of the image  
formed on said recording member.

26. An image forming apparatus including an image  
5 sensing device according to any one of claims 15 to 25,  
wherein said image forming apparatus forms a color  
image by using said image sensing device.

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